

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application.

**COMPLETE LISTING OF THE CLAIMS:**

Claims 1-20 : (Canceled)

Claim 21 : (Currently Amended) An apparatus for controlling optical amplifier gain, comprising:

- a) a source for generating a gain control signal;
- b) an optical amplifier for receiving at least one of optical input signal channels at a first end, the optical amplifier comprising an amplification medium;
- c) a coupler for providing the gain control signal to the optical amplifier at a second end thereof; and
- d) the source being arranged to generate the gain control signal at a power level greater than the stimulated Brillouin scattering threshold of the amplification medium to produce that produces stimulated Brillouin scattering in the amplification medium of the optical amplifier, wherein the gain control signal is at a higher wavelength than any of the optical input signal channels.

Claim 22 : (Previously Presented) The apparatus according to claim 21, comprising a controller for identifying a change in an input signal and for varying the power level of the gain control signal to compensate for the identified change.

Claim 23 : (Previously Presented) The apparatus according to claim 22, in which the controller comprises a monitor for monitoring a power of the input signal and for varying the power level of the gain control signal to compensate for changes in the monitored power.

Claim 24 : (Previously Presented) The apparatus according to claim 22, in which the controller comprises apparatus for obtaining information on the at least one optical input signal channel from one of an optical supervisory channel and a pilot tone.

Claim 25 : (Previously Presented) The apparatus according to claim 21, in which the gain control signal falls within a gain bandwidth of the optical amplifier.

Claim 26 : (Previously Presented) The apparatus according to claim 21, further comprising a monitor for monitoring the power level of the gain control signal.

Claim 27 : (Previously Presented) The apparatus according to claim 21, in which the amplifier is a Raman amplifier.

Claim 28 : (Previously Presented) The apparatus according to claim 21, in which the amplifier is a distributed Raman amplifier.

Claim 29 : (Previously Presented) The apparatus according to claim 21, in which the amplifier is a rare earth doped fiber amplifier.

Claim 30 : (Currently Amended) A method of controlling optical amplifier gain, comprising the steps of:

- a) introducing at least one of optical input signal channels into a first end of an optical amplifier, the optical amplifier comprising an amplification medium;
- b) generating a gain control signal and introducing the gain control signal at a second end of the optical amplifier; and

c) generating the gain control signal at a power level greater than the stimulated Brillouin scattering threshold of the amplification medium to produce that produces stimulated Brillouin scattering in the amplification medium of the optical amplifier, wherein the gain control signal is at a higher wavelength than any of the optical input signal channels.

Claim 31 : (Previously Presented) The method according to claim 30, including the steps of identifying a change in an input signal and varying the gain control signal power level to compensate for the identified change.

Claim 32 : (Previously Presented) The method according to claim 31, including the step of monitoring a power of the input signal and varying the gain control signal power to compensate for a change in the monitored power.

Claim 33 : (Previously Presented) The method according to claim 31, including obtaining information at the at least one optical input signal channel from one of an optical supervisory channel and a pilot tone.

Claim 34 : (Previously Presented) The method according to claim 30, in which the gain control signal falls within a gain bandwidth of the optical amplifier.

Claim 35 : (Previously Presented) The method according to claim 30, further including the step of monitoring the power level of the gain control signal.

Claim 36 : (Previously Presented) The method according to claim 30, in which the amplifier is a Raman amplifier.

Claim 37 : (Previously Presented) The method according to claim 30, in which the amplifier is a distributed Raman amplifier.

Claim 38 : (Previously Presented) The method according to claim 30, in which the amplifier is a rare earth doped fiber amplifier.

Claim 39 : (Previously Presented) The apparatus according to claim 21, wherein the wavelength of the gain control signal is around 10 to 15 nm higher than any of the optical input signal channels.

Claim 40 : (Previously Presented) The method according to claim 30, wherein the wavelength of the gain control signal is around 10 to 15 nm higher than any of the optical input signal channels.